# THE LOG OF THE LAB

*Items of Current Research*

FOREST PRODUCTS LABORATORY* FOREST SERVICE

U. S. DEPARTMENT OF AGRICULTURE

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## DRY KILN METHODS FOR SEED EXTRACTION

OPENING of the ripe seed cones of evergreen forest trees is a relatively slow natural process, often rendered more uncertain by vagaries of the weather. The most practical method of getting seed of the conifers for planting is to gather the cones at maturity and make them deliver their contents by a brief period of artificial drying.

At the request of foresters concerned with nursery and planting work, the Forest Products Laboratory recently undertook to improve the design of cone-drying equipment to secure greater speed, certainty, and uniformity of results. It was found that underlying principles of air circulation, applied so successfully by the Laboratory to the development of the internal-fan lumber kiln, were equally adaptable to cone drying – the only difference being that, with lumber, opening up or cracking of the surface must be prevented at all hazards, whereas with seed cones that is exactly the effect desired. By suitable management the kiln cycle can be made to work in either direction.

As redesigned, the new cone kiln or drying cabinet is provided with automatically regulated steam heating coils. Humidity of the atmosphere within the kiln is also subject to automatic control; if the air becomes too dry, the humidity is increased by the introduction of live steam; if too moist, it is decreased by means of outside air drawn in by a ventilating fan. Air circulation within the kiln is produced by two motor-driven fans of the straight-blade reversible-disc type. The fresh cones are placed in trays, which are stacked on a lift-truck platform and wheeled into the kiln.

Since seeds are sensitive to excessive heat, which reduces their vigor of survival and growth, it is essential that certain temperatures be not exceeded during the extraction process. The new kiln is specially designed to deliver to each tray large volumes of air at just the right temperature and humidity, so that safe, rapid, and uniform drying out of the cones is assured. The time required to open a charge of cones is less than half that required by the older equipment not provided with adequate forced circulation.

The first kiln of this type has been installed at nursery headquarters of the Ozark National Forest in Arkansas, and plans are under way for the construction of two units at a recently established Forest Service nursery in Michigan.

### *PLASTICS FROM WOOD WASTE*

*How to develop useful products from sawdust, shavings, and other wastes that accumulate at sawmills and woodworking plants is a basic problem of*

* *Maintained at Madison, Wis., in cooperation with the University of Wisconsin.*

*forest industry. A hopeful lead is the production of a plastic material from sawdust. The Forest Products Laboratory has developed simple processes for converting sawdust into a molding powder of true plastic properties. The powder is hot-pressed in molds to form sheets, discs, or other shapes having high density, good body, and a glossy surface. This material holds promise of furnishing a durable low-cost moldable and machinable plastic that may find use as floor tile, wall board, and a variety of other products, at a cost per square foot estimated to be equivalent to the general price level of lumber.*

## LOADING TESTS BEGUN ON GLUED-ARCH BUILDING

REPRESENTING an extra heavy fall of "snow," a pile of sandbags, 45 feet long and as high as a man's head, has been laid across the roof of the Forest Products Laboratory's new plywood service building. Weighing in all 31,500 pounds, the sandbags follow the line of one of the glued laminated wood arches forming the framework of the building. They will be left in place all winter to provide a time-loading test of the structural system used.

The weight now supported is 50 percent greater than the snow load of 30 pounds per square foot of roof area required under the provisions of most state building codes. Yet careful measurements show a downward deflection of only one and four-hundredths inches at the peak of the arch and a spreading outward of only a quarter of an inch at each shoulder, with little or no tendency toward further yielding.

So far as known, this structure was the first in the United States in which three-hinged arches of glued wood construction were used as unit framing members for both walls and roof. Structural plywood panels and cellular units form the outer covering. The result is a building of great strength and economy of materials, which provides an unobstructed interior of fine appearance and of adequate proportions for industrial and storage purposes.

Later developments indicate that glued laminated wood arch construction may become common in America, as it already is in one form or another in some European countries. A college chapel at Menominee, Mich., has laminated ornamental beams fabricated for its ceiling support. Plans for a junior high school now under construction in Racine, Wis., provide laminated wooden arches of 60-foot span for the roof of the gymnasium and laminated beams of 38-foot span for the ceiling of the music room. A large dance pavilion near Green Bay, Wis., has laminated wooden arches of approximately 40-foot span supporting the roof.

The Forest Products Laboratory is continuing the investigation of glued arches and plywood construction both in the testing room and in service, with the object of adapting these developments more fully to the needs of American builders.

### *Beg Your Pardon!*

In the July 20 issue of the *Log of the Lab* it was stated that 50,000 ponderosa pine posts for shelterbelt fencing, which were treated under specifications prepared by the Laboratory, were from the "Custer National Forest of North Dakota." The Custer does not touch

North Dakota, and as a matter of fact that State has no National Forests at present. Shelterbelt headquarters inform us that the posts were cut from trees in the Harney National Forest and were shipped from the *town* of Custer, both in *South* Dakota.

## AN IMPROVEMENT IN SMALL MILL DESIGN

MOST of the "portable" sawmills now in use are inefficient, their operation causing a 15 to 20 percent loss of material due to wide saw-kerf and inaccurate manufacture. Such losses frequently hold the balance between profit and loss for the small operator and between merchantability and non-merchantability of his product.

Forest Products Laboratory engineers have evolved a new design for a portable sawmill which bears the promise of more economical and efficient lumber production from small timber holdings and small blocks of large holdings. Keynotes of the design are the use of a traveling horizontal bandsaw and reduction of the number and weight of moving parts to a minimum.

By eliminating the log carriage altogether the length and height of the mill are reduced by approximately one-half, so that the whole machine can be mounted on wheels and easily moved about by an ordinary tractor. The log is held while the horizontal bandsaw traverses its length taking off successive cuts. After each traverse the log is mechanically raised to give the right thickness for the next cut. Power for operation can be obtained from the tractor itself by means of a belt and pulley. While the design has not yet proceeded beyond the working drawing and model stage, its compactness, simplicity, and efficient utilization of mechanical parts have received favorable comment from prominent manufacturing concerns. As a matter of fact, the Laboratory designers have succeeded in radically improving an earlier commercial type of portable mill operating on the traveling bandsaw principle, of whose existence they were unaware until a few weeks ago.

WANTED: INFORMATION ON TREATING COMPOUNDS — The effectiveness of a material offered as a wood preservative is not considered established by the Forest Products Laboratory until it has been demonstrated by long and successful use in actual service. Existing data are markedly deficient in long-time records of wood treated with the large class of preservatives known as "proprietary" — that is, preservatives of secret or patented composition which are promoted as the exclusive property of some one commercial concern. A high percentage of records of preservatives of this kind are lost before they yield much information, on account of changes in ownership, loss of interest on the part of the owner, failure to keep the material identified, and other causes.

The Laboratory is trying to collect whatever information is available in this field, in order to work out average life expectancies for the many proprietary treatments that are offered. If you have used any of the proprietary preparations for wood preservation in the past and have kept a record of the service rendered, or if you know of any such records that have been kept by other users, the Laboratory will appreciate receiving the information that you have.

## QUESTIONS THE LABORATORY IS ASKED

*Q. Are walnut hulls used as a dye material?*

A. In earlier times stain extracted from walnut hulls was used to some extent as a dye material. With the coming of mineral dyes, however, domestic dyes of vegetable origin have practically disappeared from the market. Present-day lists show no dyes manufactured from walnut hulls.

*Q. What woods are used in the manufacture of bars for xylophones?*

A. To our knowledge the only wood used for xylophone bars at the present time is Honduras rosewood. Brazilian rosewood was formerly used, but the wood proved too soft to withstand the constant hammering of professional playing. In preparing the wood for xylophone bars the logs are quartered and the pieces cut into planks one inch thick, which are air dried from 2 to 7 years.

## TWO MANUALS PUBLISHED

After a somewhat premature announcement in our last issue, the Laboratory's *Wood Handbook* is at last printed and available. Wood users will find it one of the most comprehensive manuals of its kind ever written, containing more than 300 pages of basic information on wood as a material of construction, and data for its use in design and specifications. Orders for the *Wood Handbook* should be sent to the Superintendent of Documents, Government Printing Office, Washington, D. C. Enclose 25 cents per copy in cash or money order, as stamps are not accepted. At last reports 9,000 copies had been sold.

Also announced in the previous issue and now in print is the manual entitled *Preservative Treatment of Wood by Pressure.* Prepared for technical use by engineers, superintendents, inspectors, and others directly concerned with the operation of treating plants and the preparation of treating specifications, this manual is for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents per copy. It is designated as U. S. Department of Agriculture Miscellaneous Publication No. 224.

## THE LABORATORY AND THE NATION

### 1. Employment

Forestry's greatest obligation is to make forests serve the American people as a productive asset providing a self-sustained and permanent basis of work, wages, and the satisfactions of home and community life.

How long before both public and private forest ownership will be able to carry their full quota of jobs in the woods, and forest industry yield maximum work in mill and factory? It depends on how useful wood is and may become in our modern civilization, and that in turn depends on how economically and efficiently wood can be harvested, manufactured, converted into new products, and otherwise adapted to 20th-century industrial and housing needs. The research and accomplishments of the Forest Products Laboratory are devoted to solving these problems.

*(To be continued)*